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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,237	07/15/2003	Wade H. Bailey III	06405 USA	8903

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AIR PRODUCTS AND CHEMICALS, INC.  
PATENT DEPARTMENT  
7201 HAMILTON BOULEVARD  
ALLENTOWN, PA 181951501

EXAMINER

ZUCKER, PAUL A

ART UNIT PAPER NUMBER

1621

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/620,237

**Applicant(s)**

BAILEY ET AL.

**Examiner**

Paul A. Zucker

**Art Unit**

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5,7-10,12 and 14-17 is/are allowed.
- 6) ☒ Claim(s) 1,2,6,11,13 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 3 and 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/15/2003</u> . | 6) <input type="checkbox"/> Other: ____  |

S-00

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 6 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 6 and 13 recite a 1,3-dioxane (heterocycloalkyl) and substituted phenyl group as identities for R<sub>3</sub>. There is insufficient antecedent basis for these limitations in the claims. Claims 6 and 13 are therefore rendered indefinite.
2. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 18 sets forth the process in a reaction flow diagram. The use of flow diagrams in claims is improper (See 37 CFR 1.58 (a)). It is impossible to determine the claimed conditions for reaction from the reaction schemes presented. Applicant will need to use words to describe what the reaction conditions are in the process claim. Claim 18 is therefore rendered indefinite.
3. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The groups R<sub>1</sub>-R<sub>5</sub> have not been defined. It is therefore impossible to determine the intended scope of Applicants' claimed process and claim 18 is rendered indefinite.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1, 2, 11, 19 and 20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for compounds  $\text{RSF}_4\text{OCF}_3$  which have organic groups corresponding to those set forth in the specification (Paragraphs [0024]-[0028]), does not reasonably provide enablement for any arbitrary organic group. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

There are many factors to be considered when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any necessary experimentation is "undue."

These factors include, but are not limited to:

- a. the breadth of the claims: In the instant case the claims are extremely broad encompassing the production of any organic compound which contains the " $\text{-SF}_4\text{OCF}_3$ " group. This, of course, includes strained, unstable and/or reactive molecules as well;
- b. the nature of the invention: The instantly claimed invention involves compositions that have utility in liquid crystal compositions which are highly sensitive to the structure of the organic group.

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- c. the state of the prior art: the state of the prior art is generally considered high but would not allow one to predict in advance, based on Applicants' disclosure which of the infinite variety of possible organic structures would produce compounds having utility as liquid crystals
- e. the amount of direction provided by the inventor: The inventor provide direction for the production of compounds that have an aromatic nucleus directly attached to the  $-\text{SF}_4\text{OCF}_3$  group as in the general structure of Compound I (Specification, paragraph [0024]). There is no guidance given for the selection among the infinite number possible organic groups of those structures which would have utility in liquid crystal compositions;
- f. the existence of working examples: The only working examples provided are directed to production of compounds that have an aromatic nucleus directly attached to the  $-\text{SF}_4\text{OCF}_3$  group as in the general structure of Compound I (Specification, paragraph [0024]).

Based upon the analysis above, the Examiner concludes that undue experimentation is required to make and use the claimed invention.

### ***Claim Objections***

- 5. Claims 3,4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Allowable Subject Matter***

6. Claims 5, 7-10, 12 and 14-17 are allowed. Claims 3 and 4 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art, Reiffenrath et al (US 5,055,223 10-1991, teaches (Column 1, line 1- column 2, line 17) a genus of compounds, with utility in liquid crystal compositions, which are similar in structure to those instantly claimed but which differ by their termination in an  $-SF_5$  group. Reiffenrath neither discloses nor fairly suggests that his compounds be modified by replacement of a fluorine atom in the terminal  $-SF_5$  group with a  $-OCF_3$  group. Thus one of ordinary skill in the art would not have been motivated to modify the compounds of Reiffenrath to produce the instantly claimed invention.

***Conclusion***


7. Claims 1, 2, 6, 11, 13 and 18-20 are rejected. Claims 3 and 4 are objected to. Claims 5, 7-10, 12 and 14-17 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 571-272-0650. The examiner can normally be reached on Monday-Friday 5:30-2:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**PAULA A. ZUCKER, PH.D.**  
**PRIMARY EXAMINER**